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DOI:

[10.1016/j.schres.2016.05.017](https://doi.org/10.1016/j.schres.2016.05.017)

Document Version

Peer reviewed version

[Link to publication record in King's Research Portal](#)

Citation for published version (APA):

Stubbs, B., Firth, J., Berry, A., Schuch, F. B., Rosenbaum, S., Gaughran, F., Veronesse, N., Williams, J., Craig, T., Yung, A. R., & Vancampfort, D. (2016). How much physical activity do people with schizophrenia engage in? A systematic review, comparative meta-analysis and meta-regression. *Schizophrenia Research*.
<https://doi.org/10.1016/j.schres.2016.05.017>

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Manuscript word count 3729

Abstract word count 250

**Peer support interventions seeking to improve physical health and lifestyle behaviours among
people with serious mental illness: a systematic review**

Submission to International journal of Mental health Nursing

Abstract (word count 248/250)

People with serious mental illness (SMI) experience a premature mortality gap of between 10-20 years. Interest is growing in the potential for peer support interventions (PSI) to improve the physical health of people with SMI. We conducted a systematic review investigating if PSI can improve the physical health, lifestyle factors and physical health appointment attendance among people with SMI. A systematic search of major electronic databases was conducted from inception until February 2016 for any article investigating peer support interventions seeking to improve physical health, lifestyle or physical health appointment attendance. From 1347 initial hits, seven articles were eligible, including 3 pilot randomized control trials (RCTs) (n intervention =85, n=control =81) and 4 pre and posttest studies (n=54). There was considerable heterogeneity in the type of PSI and the role of the peer support workers (PSW) varied considerably. Three studies found that PSI resulted in non-significant reductions in weight. Evidence from 3 studies considering the impact of PSI on lifestyle changes was equivocal, with only one study demonstrating PSI improved self-report physical activity and diet. Evidence regarding physical health appointment attendance was also unclear across 4 studies. In conclusion, there is inconsistent evidence to support the use of PSW to improve the physical health and promote lifestyle change among people with SMI. The small sample sizes, heterogeneity of interventions, outcome measures and lack of clarity about the unique contribution of PSW, means no definitive conclusions can be made about the benefits of PSW and physical health in SMI.

Systematic review registration - PROSPERO registration number 2016:CRD42016035803

Keywords: Peer support, physical health, cardiovascular disease, lifestyle, psychosis,

Introduction

People with serious mental illness (SMI), defined as schizophrenia spectrum and bipolar disorder, experience a premature mortality gap of between 10 and 20 years from the general population (Walker et al., 2015). The 'stolen years' are predominantly attributable to cardiovascular, respiratory and metabolic diseases (Lawrence et al., 2013). In particular, the two to three fold increased prevalence of metabolic syndrome (Vancampfort et al., 2015), type two diabetes (Stubbs et al., 2015) and cardiovascular disease (Gardner-Sood et al., 2015) in people with SMI are of great concern.

Lifestyle interventions, including physical activity and dietary advice can help improve the physical health of people with SMI (Firth et al., 2015; Rosenbaum et al., 2014). Lifestyle interventions that incorporate social support and motivational components have been found to be most effective (Gross et al., 2016; Vancampfort et al., 2016b). Despite the fact that effective interventions to improve physical health exist, many people with SMI have difficulty accessing appropriate medical care and attending lifestyle interventions (Docherty et al., 2016). Given this, there is a need to develop novel ways to improve physical health care access, treatment and interventions in this population (Docherty et al., 2016).

Across the chronic disease literature, the use of peer support led interventions has been used with good success for some time (Boothroyd and Fisher, 2010; Zhang et al., 2016). There is evidence that peer support interventions delivered by mentors can have a positive impact on glycemic control, blood pressure, body mass index, increasing physical activity, self-efficacy, reducing depression and perceived social support (Dale et al., 2012). Within the past decade, there has been considerable interest in assessing the value and role of peer support interventions to improve outcomes in people with SMI (Castelein et al., 2015; Davidson et al., 2012; Davidson et al., 2006). Within the context of SMI, peer support interventions include support or services provided to people with a mental illness by other people with lived experience of mental illness themselves

(Lloyd-Evans et al., 2014). A recent systematic review and meta-analysis demonstrated there is promising evidence that peer support interventions may improve hope, recovery and empowerment (Lloyd-Evans et al., 2014). Several other narrative reviews have also considered the potential for peer support to improve mental health and recovery in people with SMI (Davidson et al., 2012; Davidson et al., 2006; Repper and Carter, 2011). In addition, recent research has suggested that treatment engagement strategies which are recovery focused (Dixon et al., 2016) and integrate physical and mental healthcare are essential to overcome the physical healthcare disparity in people with SMI (Happell et al., 2015). Peer support interventions such as a peer led weight loss program delivered by a person with mental illness who has experienced weight loss in conjunction with a professional, might increase adherence and potential patient outcomes (Aschbrenner et al., 2015b). However, to date no systematic review has to our knowledge considered if peer support interventions can improve physical health outcomes and lifestyle behaviours. With this growing promise of peer support interventions in SMI and the benefits of peer support in improving physical health and lifestyle factors in other long term conditions, peer support might offer a valuable approach to improve health outcomes in people with SMI.

Given the need for novel, sustainable and effective interventions to improve physical health in people with SMI and the potential for peer support to help, we undertook a systematic review of the available evidence. The specific aims were to establish if:

1. Peer support interventions improve physical health parameters (e.g. metabolic risk factors) in people with serious mental illness (SMI).
2. Peer support interventions improve physical health appointment attendance.
3. Peer support interventions improve outcomes, attendance and adherence to lifestyle interventions (e.g. physical activity, nutritional interventions).

Method

This systematic review adhered to the MOOSE guidelines (Stroup et al., 2000) and PRISMA statement (Moher et al., 2009), following a predetermined published protocol (PROSPERO registration number 2016:CRD42016035803).

Inclusion criteria

We included interventional (Randomised control trials (RCTs), controlled clinical trials (CCTs)) and observational (prospective or cross sectional) studies that meet the following criteria: 1) Include people with SMI (including psychosis, bipolar disorder). 2) Employed a peer support intervention addressing any physical health outcome or lifestyle factors (including physical activity, nutrition). Specifically, we were interested in peer support, delivered in any format (e.g. group or single) seeking to improve any physical health, lifestyle factor or physical health care appointment attendance. In line with previous research (Davidson et al., 2006) peer support was defined as involving one or more persons who have a history of mental illness and who have experienced significant improvements in their psychiatric condition offering services and/or supports to other people with serious mental illness with a specific focus on improving physical health outcomes or lifestyle factors. We did not include smoking cessation interventions which were covered in a recent systematic review (McKay and Dickerson, 2012). Studies conducted in any setting (e.g. inpatients and outpatients) were eligible. Only English language studies were eligible.

Information sources and searches

Two independent authors searched MEDLINE, PsycINFO, EMBASE and Pubmed without language restrictions from inception till 25th February 2016, using the key words: 'schizophrenia' OR 'psychosis' OR 'bipolar' OR 'mental illness' OR 'serious mental illness' OR 'severe mental illness AND 'peer support' OR 'peer led' or 'peer*' AND 'physical health' OR 'cardiovascular' OR 'heart' OR 'physical illness' or 'lifestyle' OR 'physical activity' OR 'exercise' or 'nutrition'. In addition, reference

lists of all eligible articles and related systematic reviews were screened to identify potentially eligible articles (Davidson et al., 2012; Davidson et al., 2006; Lloyd-Evans et al., 2014).

Study selection

After removal of duplicates, one reviewer screened the title and abstracts of all potentially eligible articles. A second author ran additional searches and a final list of included articles was developed by consensus.

Data extraction

One author (BS) extracted data using a predetermined data extraction form. A second author reviewed the extracted data and/or quotations and validated the extraction. The data extracted included first author, country, setting, population, type of the study (prospective, controlled or randomized controlled trial), number of participants included in the article (including mean age, % female) and details of the intervention and outcome. Specifically, we obtained information regarding the nature of the peer support intervention and considered how the peer support input may have influenced the outcomes in each study.

Data synthesis

Due to the paucity and heterogeneity of studies identified, formal quantitative meta-analysis was not possible. Therefore, we employed a best evidence synthesis to identify the key results and limitations in each study and attempted to disentangle the potential role of the peer support workers in each study.

Results

Study selection

Following the removal of duplicates, a total of 1347 articles were considered at the title and abstract level. 28 full texts were reviewed and 21 were excluded with reasons (see figure 1), with 7 unique studies meeting the eligibility criteria (Aschbrenner et al., 2015a; Aschbrenner et al., 2015b; Bartels et al., 2013; Druss et al., 2010; Goldberg et al., 2013; Kelly et al., 2014; Schneider et al., 2011). Full details of the search results are summarized in figure 1.

Figure 1 here

Details of included studies and participants characteristics

The details of the included studies are summarized in table 1. Briefly, three of the included studies were pilot RCTs utilising a peer support intervention (n=85) versus a control group receiving treatment as usual or waiting list (n=81) (Druss et al., 2010; Goldberg et al., 2013; Kelly et al., 2014). The other four studies included a pre and posttest design (n=54) (Aschbrenner et al., 2015a; Aschbrenner et al., 2015b; Bartels et al., 2013; Schneider et al., 2011). The sample size across the studies ranged from 10 (Aschbrenner et al., 2015a) to 80 (Druss et al., 2010). The mean age of included participants ranged from 44.3 years (Schneider et al., 2011) to 58.5 (Bartels et al., 2013), and most included people with schizophrenia spectrum disorders (details in table 1). Details of the nature of the peer support intervention utilised in each study are summarised in table 1 and will be explored in more details below in the best evidence synthesis of the results.

Table 1 here

Peer support interventions to improve physical health and lifestyle

Findings from pre and posttest studies

The results from the included studies are summarized in table 2 and will briefly be explored. Aschbrenner et al (2015b) utilized a pre and post test pilot study among community mental health service users (n=13) who were obese (BMI 41.5) and on stable antipsychotic medication. The

authors conducted a 24 week weight loss program involving three components: 1) a weekly 90 minute weight management group led by two lifestyle coaches and supported by a peer support worker who had an SMI. 2) 2 x week optional exercise class for 1 hour led by a fitness instructor. 3) mHealth (mobile) technology and social media throughout the study to increase motivation. The peer support worker had a co-facilitator role in the weekly weight loss class, sharing their experience of making positive changes to lifestyle and also provided online support. The authors found that there were no significant improvements in weight, although 45% of the sample lost weight compared to their baseline weight. The authors found no significant improvement in fitness (determined by the 6 minute walk test), although participants did increase their baseline result distance by 45%. Nonetheless, the majority of participants agreed (46%) or strongly agreed (36%) that the peer support worker input was helpful. Given the potential influence of the twice a week optional exercise class which does not appear to have had input from the peer support worker, it is difficult to know how much impact can be attributed to the peer support worker.

Aschbreener et al., (2015a) conducted a mixed methods study which included a pre and posttest design with 10 people with SMI. The intervention lasted for 24 weeks and included four components: 1) personalised fitness training led by a fitness instructor with a transition period where the peer support worker gradually took over responsibility for delivering the intervention, 2) 1:1 peer health coaching, 3) motivational texts and 4) physical activity monitoring and feedback. The peer support workers played an integral role in the intervention. The authors found that no significant difference was observed in weight after the intervention, although the mean weight loss across the group was 2.7kgs.

Schneider et al., (2011) conducted a peer led weight loss program for 19 weeks including a weekly session for 90 minutes among 14 people with SMI (3 dropped out). The two peer support workers

were trained in a wellness programme targeting weight loss, diet and increasing physical activity. The authors found that the 11 participants lost on average 2.5lbs but this was non-significant.

A pre and post study designed to help older people with SMI improve their confidence in primary care encounters (Bartels et al., 2013) included 17 people with SMI. The peer support workers worked in a co-facilitator manner over 2 months including a weekly 90 minute session covering 6 modules (details in table 1) which included simulation of primary care encounters. No physical health or lifestyle measures were investigated. However, the authors found that the intervention resulted in non-significant improvement in confidence in communicating with primary care encounters ($p=0.1$), asking about treatment options ($p=0.1$) and medical improvements ($p=0.15$).

Findings from pilot RCTs

Druss et al (2010) investigated the impact of a peer led intervention delivered over 6 sessions aiming to increase self-management. A total of 41 people with SMI were allocated to the intervention group ($N=37$ follow up) and 39 were allocated to usual care ($N=29$ follow up). Peer support workers were trained to lead the intervention and the modules covered included 1) Overview of self-management 2) Exercise and physical activity 3) Pain and fatigue management 4) Healthy eating on a limited budget 5) Medication management 6) Finding and working with a regular doctor. The authors found that physical quality of life improved in the intervention group but the group x time interaction was not significant. The authors found that there was an increase in self report in physical activity in the intervention group although this was not significant versus the control group. The intervention group were significantly ($p=0.04$) more likely to report attending a primary care visit, with an 8.3% increase in the intervention group versus 17.1% decline in the control group.

Goldberg et al., (2013) investigated the impact of a peer led/ co peer led (i.e. mutually delivered by a professional and a peer support worker) intervention based on a chronic self-management program

across a 60-75 minute session once a week for 13 weeks. In total, 32 people with SMI were randomised to the intervention and 31 received usual care. The intervention program was modular including modules on lifestyle factors and communicating with medical staff. The peer support workers also provided participants with telephone support during the intervention outside of the formal course. No physical health outcomes were reported. Self-report physical activity ($p=0.049$) and healthy eating ($p=0.019$) significantly improved versus controls. The authors also established that the intervention group reported improvements in physical functioning ($p=0.04$) and use of healthcare ($p=0.004$).

In a final pilot RCT, Kelly et al., (2014) investigated the impact of a peer led self-management program over 6 months to improve health and support health care utilization. From 23 people with SMI, 12 were randomised to the intervention and 11 to the control group. The authors found that the intervention group reported significantly less pain ($p<0.05$) and pain causing interference ($p<0.05$) and less need for physical health medications versus control. No lifestyle behaviours were investigated. The intervention group had no-significant effect on medical appointment attendance.

Table 2 here

Discussion

The current systematic review, is to our knowledge the first to consider the potential value of peer support interventions to improve physical health, lifestyle and physical health appointment attendance. Despite the current commendable calls to implement peer support interventions to improve the physical health of people with SMI, the evidence base is equivocal and characterized by studies with small sample sizes and heterogeneous study designs and interventions. In particular, there is a paucity of well conducted studies (i.e. large, representative randomized controlled trials). However, this is in some regards not surprising, given that peer recovery support intervention programs are generally still in their infancy. Nonetheless, there have been recent policy decisions to increase the delivery of peer support programs to improve physical health and lifestyle factors in people in Australia (Happell et al., 2015, Happell et al., 2016) and Internationally (Dixon et al., 2016). Across the 7 included studies, there is a suggestion from three papers (Aschbrenner et al., 2015a; Aschbrenner et al., 2015b; Schneider et al., 2011) that peer support interventions reduce weight, although none of these results were significant. Very few other physical health outcomes of potential interest (e.g. diabetes outcomes) were considered within the literature. Evidence from 3 studies suggests that peer support may influence lifestyle changes. Specifically, Ashbrenner et al (2015b) found that fitness was increased whilst in Druss et al., (2010) the intervention group increased their self-reported physical activity, although both of these results were non-significant. Only Goldberg et al (2013) found that the intervention group had self-reported improvements in physical activity and diet versus a control group. One study (Bartels et al., 2013) found that peer support interventions resulted in a non-significant increase in participants reporting of physical complaints, whilst another (Druss et al., 2010) found the intervention group were significantly more likely to report attending a primary care appointment, a finding that was replicated by Goldberg et al (2013). Finally, Kelly et al (2014) found their peer support intervention had no effect on emergency or routine medical appointments.

The literature to date has suggested that peer support interventions might improve some other outcomes. Specifically, Druss et al., (2010) found that the intervention resulted in a non-significant improvement in physical health related quality of life, whilst Kelly et al (2014) found that the peer support intervention improved pain and pain causing interference, although no effect was found on several physical health conditions. Goldberg et al (2013) found that the intervention significantly improved physical functioning. Surprisingly, few studies have investigated the impact of peer support interventions on other physical health outcomes such as cardiometabolic markers including diabetes outcomes.

There is without question an urgent need to tackle the scandal of premature mortality (Thornicroft, 2011) and address the physical health disparity in terms of predisposition to physical comorbidity and inferior quality of care (De Hert et al., 2011; Mitchell et al., 2014). Clearly, the role of peer support interventions has potential and are commendable and inclusive, however, the quality of evidence is inadequate at this stage to recommend widespread implementation. Specifically, there has been considerable heterogeneity in terms of the peer support intervention design and input, which makes it difficult to compare the interventions with each other. Moreover, across almost all of the studies, the peer support intervention has often been only one component of a wider intervention which sought to improve physical health/ lifestyle and often included additional professional led interventions to improve health. The total sample sizes using peer support interventions have totaled up to 136 people, with most of the studies included in this review containing less than 20 participants. Taken together, this makes it difficult to evaluate the impact of peer support interventions on health outcomes and support their use in routine clinical practice.

In order for peer support worker led interventions to be successful in routine clinical practice, it is important that peer support workers are adequately supported so that they are confident to lead/ co-lead interventions, since many feel they lack credibility and confidence (Vandewalle et al 2016).

In particular, peer support workers may benefit from support from clinicians with expertise in physical health (e.g. dual trained nurses, Happell et al., 2015) or physiotherapists/ exercise physiologists regarding physical activity and exercise (Stubbs et al., 2015, Lederman et al 2016). Moreover, peer support workers should be supported to ensure they have assistance to deal with any tensions with other service users and overcome cultural impediments and poor organisational arrangements/ policies (Vandewalle et al., 2016). There is some evidence from the included studies that peer support workers were reluctant to be seen as experts or coaches and preferred a co-learning model (Ascbrenner et al 2015a). Participants across several studies endorsed the role and values of peer support workers as helpful and offering a source of hope (Aschbrenner et al 2015b, Bartels et al 2013).

Clearly, there is a need for future well designed, adequately powered randomised controlled designs to investigate the impact of peer support interventions on physical health outcomes and lifestyle behaviours. Given the increasing emphasis placed on peer support interventions to improve health outcomes in policy, funding is required in order for robust interventions to be developed and tested. Such interventions should involve peer support workers at all stages of the project from the design stage onwards and seek to address pre specified outcomes and follow recognised standardised criteria such as the CONSORT. In particular, future studies should seek to consider the impact of peer support interventions on weight, diabetes risk factors and objectively assessed physical activity levels, for example using accelerometers to measure activity levels. With regard to the latter, there is some provisional evidence that self-reported physical activity/ functioning increases from peer support (Goldberg et al 2013). However, given the concerns about the validity of self-report physical activity measures (Soundy et al., 2014; Stubbs et al., 2016) there is a need for future objective measurement to confirm or refute the earlier findings. The role of social support is a key facilitator to promote physical activity among people with SMI (Gross et al., 2016) and a pilot study is currently underway to consider the impact of peer support on physical activity levels and fitness in the United

States (Jerome et al., 2012). Another published protocol with a study is also underway (Cabassa et al., 2015) seeking to improve lifestyle and physical health among people with SMI but the results are not yet available.

In conclusion, there is equivocal evidence regarding the potential benefit of peer support interventions for people with SMI and physical health outcomes and lifestyle change. Specifically, data from three studies found that a peer support intervention results in non-significant reductions in weight among participants. There was an absence of outcomes for peer support interventions on other physical health parameters, such as cardiometabolic risk. The evidence for peer support on lifestyle factors and physical health appointment attendance is also equivocal.

Relevance to clinical practice

It is widely known that people with SMI experience considerably worse physical health (Correll et al., 2015; Vancampfort et al., 2016a) and engage in less favorable health style behaviors (Stubbs et al., 2016). Interventions delivered by peer support workers are gaining popularity and being included in policy guidance. Our review found a paucity of studies and overall low level evidence of the benefits of peer support interventions to improve physical health and lifestyle choices in clinical practice.

Acknowledgements

None.

Declaration of interests

BS, JW, JS and TC declare they have no COI.

FG has received honoraria for advisory work and lectures from Roche, BMS, Lundbeck, and Sunovion and has a family member with professional links to Lilly and GSK;

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